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Crop cover selection to improve weed control in multi-species agrosystems in Reunion Island

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Cover crops are increasingly used for weed management in tropical regions as an alternative to herbicide. But selecting the most suitable species of cover crop to be associated with a main crop requires long-term trials. Here we present a two-years set of experiments to assess the ability of various cover crops to limit weed growth.
First, a collection experiment of 55 species and varieties was performed to assess the life cycle of cover crops in tropical climate in Reunion Island, in three different sites. This experiment allowed us to select different cover crop species whom behavior would be adapted to the different agrosystems in Reunion Island (sugarcane in rotation or intercropping, arboriculture,…). Secondly, 10 species were selected and grown in large plots to assess their ability to limit weed growth in monospecific plots as well as mixture of cover crops.
After two months of growth, the most productive cover crops showed the ability to limit weed growth to fewer than 30% of the plot (e.g. crotalaria, oat, millet…) while the less productive were unsuccessful to cope with weeds. On the contrary, all combinations of two cover crops tested in this experiment were able to limit weed growth to fewer than 30% of the plot area.
Our experiment highlights some key cover crops adapted to intercropping and rotation in multi-species agrosystems as an alternative herbicide.